Partnering With Industry: Engaging Female Role Models as Mentors in Information Technology Education

Sarah Snell, Catherine Snell-Siddle
Information Systems & Computing, Faculty of Humanities and Business, Universal College of Learning

Abstract

Female role modeling has been identified as an excellent way to encourage females into Information Technology (IT), in both education and the industry itself, in order to dispel many of the misperceptions about the industry. A literature search carried out reflected the perception that computing is considered a male domain even though there is no evidence of any difference in ability with regard to female and male performance in this area. Research conducted by the authors in 2004 on female participation in IT programs of study within polytechnics in New Zealand clearly showed that women are becoming or remain increasingly under-represented in IT. It is also evident that women have a significant contribution to make within this discipline. The research suggests that females are not only poorly represented within the IT industry in New Zealand, but that this is occurring internationally as well. Mentoring programs to promote females who are associated with IT could be the answer to overcome barriers based on upbringing, perceptions and socialization experiences. Female representation and role modeling is intensifying but more work is still required in this area to increase awareness of the types of work roles and career opportunities being carried out by both males and females in the IT industry. This paper will outline strategies and promotional initiatives the authors are planning to utilize female role models from industry in an attempt to reverse the gender imbalance that is occurring in tertiary level IT education in New Zealand.

Introduction/Literature Review

Males and females have traditionally gravitated to certain occupations within our societies for a variety of reasons. For example nursing has classically been a female dominated occupation, but one which is now starting to move down the road to gender diversification. Our changing society is now impacting on how we view the relationships between men and women and what is male or female work. The question of why we individually and as a society should be concerned with achieving equal gender diversity in our workplaces is a large study which is beyond the scope of this paper. One of the main benefits that the management literature sees accruing to organizations and occupations from striving for diversity as a whole is the creation of opportunities for competitive advantage. Arguments to support this view cover areas such as cost benefits, enhanced flexibility, creativity, resource acquisition, marketing, and problem solving abilities (Davidson & Griffin, 2003).

The particular industry under investigation in this paper is the Information Technology (IT) industry. Why should a study of female participation in the IT industry be of interest? Clearly computers and information are at the leading edge of change in our society and therefore if the general arguments advanced for competitive advantage hold then failure to achieve gender diversity in the IT industry will impact on New Zealand society. If an organization is dominated by one gender or population segment, ideas and innovations will adhere to the norms of that one segment, hence reducing the likelihood of multiple perspectives and ideas in relation to areas such as creativity and problem solving.

This declining participation of women, particularly in IT courses at New Zealand polytechnics, has been a growing topic of conversation between academics and members of the IT industry. Research carried out by the authors in 2004 gathered statistical data on enrolment trends over a five year period across six polytechnic providers in New Zealand. Results appeared similar across each institution showing a downward trend from 2000 to 2005, clearly showing an imbalance of males to females in each institution.

R.K. Coll (Ed.)
Conference Proceedings: New Zealand Association for Cooperative Education
Annual Conference, Queenstown, 27-28 April, 2006
(ISBN: 0-473-11263-9)

O'Keefe (2004) believes that barriers against women entering the IT industry are based on perceptions. He described a major perception as 'IT is either about gaming or sitting in dark corners eating pizza and coke and programming for hours and hours and you never talk to anybody' (p. 8). He believes that it is beneficial to use females who are working within IT to speak to other women in an attempt to dismantle misperceptions and to raise awareness. Thorp (2004) agreed with this concept, when she suggested that students often have problems when trying to name role models, be they either male or female, within the IT industry. She believes that mentoring programs to promote females who are associated with IT could be the answer. Rudman (2002) supports this view outlining that without role models and mentors, support and positive encouragement, barriers are raised by individuals themselves based on upbringing, perceptions and socialization experiences.

Treston (1999) describes mentoring as a relationship in which the mentor gives support, advice, feedback and guidance to the mentees (also called protégés, mentorees or novices) based on the traditional mentoring model of the apprentice learning from a master. "Mentoring supports much of what is currently known about how individuals learn, including the socially constructed nature of learning and the importance of experiential, situated learning experiences" (Treston, 1999, p. 3). This concept of mentoring is closely linked with cooperative education where students gain direct on the job experience within a specific contextual setting. Mentors are often used in co-op placements where students can be anxious and hampered by feelings of insecurity and a lack of confidence. Mentors are there to guide and assist the students in realizing their potential (Ayling, 2004). So, just as mentors are used in the workplace for cooperative education students, mentors can be enlisted as role models to dispel uncertainties and misplaced perceptions in regard to disciplines such as IT to encourage females to move into the field.

So, how well represented are women within the IT industry? A recent survey carried out by Roper Starch Worldwide (cited in Melymuka, 2001) showed that sixty-two percent of IT women believe there is a glass ceiling in the industry, and that females are not well represented especially in high level positions. The Director of Women in Technology in New Zealand – Carole Lee Davidson, states that even though exact figures are difficult to come by, trends show that women make up a tenth of the IT workforce globally (Greenwood, 2002). The presence of role models is seen as an important and excellent tool for promoting a discipline to potential gender groups. Learning from same-gender role models is effective, and if there is an obvious gap in the representation of one gender within one discipline group – this too may influence training or career choices (Grainger, 1992). Nightingale and Sohler (1994) outline various projects where schools have recruited female representatives to come in for sessions and act as role models to disciplines such as IT, in the hope of portraying the rewards of entering this type of training and to increase awareness.

'Women in Technology' is a relatively new organization in New Zealand which has been set up to represent females who are participating within IT, with an aim to encourage and empower other females into this industry by offering networking opportunities and mentors. They offer presentations and forums to women, which are led by women who are successful in their field. These presentations offer inspiring and informative learning experiences for women wanting to realize their own career and personal goals. This is an excellent opportunity to portray some of New Zealand's leading female role models within the IT industry (Women in Technology, 2003).

Findings and Discussion

The research project carried out in 2004 aimed to investigate reasons for the gender imbalance of students undertaking tertiary study in information technology (IT) in the polytechnic sector. This was carried out by gathering a range of perspectives and perceptions from students currently studying at polytechnics within IT or non-IT based programs and by obtaining statistics from institutions offering programs of IT study within the tertiary polytechnic sector. Two research methods were used; focus groups and a questionnaire. The questionnaire was sent to twenty three tertiary providers around the country. Eleven completed questionnaires were returned – a forty seven percent response rate. Results from this quantitative data appeared similar across ten institutions, with data from institution number eleven indicating a growth in female vs. male enrolments in IT programs of study from years 2001 to 2003. However, even with this inconsistency across institutions, there clearly still remained an imbalance of males to females in each institution. Perceptions as to why this is happening was explored in the focus groups.

The first focus group consisted of six male participants who were currently studying within IT – on the Bachelor of Information and Communications Technology (BICT) at UCOL. This group focused on male perspectives on female participation within IT. The second focus group consisted of six females who where both studying within IT (on the BICT program) and those that were studying at tertiary level but not in IT (studying Diploma in Business). This group focused on female perceptions and reasons for either considering IT as a career choice or not.

All potential participants were given a written information sheet about the nature and aim of the research. The information sheet also outlined how they were identified as potential participants (which was through convenience sampling), that the focus may take up to one hour of their time and that participation was entirely voluntary. It also outlined that the session would be tape recorded, that the data collected would be stored securely, anonymity was assured and information collected would be destroyed at the end of the research. Consent was obtained via the return of the tear off slip for the focus groups and consent to participate was assumed as questionnaires were filled out and returned. The data from the focus groups was subjected to thematic analysis to identify and explore common themes so that comparisons, contrasts and insights could be seen.

Of the two focus groups undertaken, lack of 'interest' was the most common theme emerging in response to questions asked in relation to perceptions of female participation. Another common theme was 'direction'. All participants agreed little advice or teaching on IT was given at school. Most participants agreed that it is not clear as to what career opportunities are available or what job tasks the IT industry offers. This has also been identified in the literature as an issue that needs addressing (O'Keefe, 2004; Young, 2000). The two themes identified are not mutually exclusive and have the potential to influence each other: if appropriate 'direction' is given to females regarding the IT industry, ultimately this would lead to more 'interest' and an increase in the gender balance.

Below are some of the quotes made in the focus groups in regard to female participation with IT:

> No, I never considered working in IT – I like fresh air, moving around and talking to people – computers are none of those things
>
> Females are more interested in soft, arty, caring careers.
>
> IT is geeky.
>
> Interest levels of females and males are different. Females are computer users, not techies.
>
> Teachers are not aware of the industry as it was not an option whey they were young.
>
> Many teachers in schools are self-taught hobbyists (at best) and have no concept of what the IT industry can offer. Schools are required to show viable career paths – I do not believe schools do this in IT.
>
> Schools don't understand the ICT industry and the careers that are available – therefore marketing is a big problem.
>
> Make it clear that the IT industry is not all about hardware and can choose different avenues to follow.
>
> Use role models or profile past female students to promote.
>
> I think possibilities for career opportunities need to made clearer.
>
> There was never any promotion on IT at school when I was choosing a career path to go down.

The literature search and research carried out reflects the perception that computing is considered a male domain even though there is no evidence of any difference in ability with regard to females and males performance in this area. The literature suggests much of this gender misconception stems from

both parents and schools, and the way individuals are socialized at a very young age. Even though women now constitute the majority of those participating in higher education, the concentration of learning that these women are participating in, is in traditionally female fields such as education and health. Female representation and role modeling is intensifying but more work is still required in this area to increase awareness of the types of work roles and career opportunities being carried out by both males and females in the IT industry.

It is clear from the literature that females are indeed participating at a minimal level in IT and that some urgency is required to change this continuing trend in order to obtain diversity and participation within the IT industry. There are some efforts within New Zealand to encourage and support females into the IT industry, such as Women in Technology, but despite this, the gender imbalance remains.

Changing Perceptions

To challenge and change perceptions, clear guidance needs to be provided in regard to career options and roles that can be carried out within the industry. In an article published by Martin (2002, ¶11), Cherry Vanderbeke, general manager of Gen-I's software solutions says: "Girls don't realize the variety of roles within IT" and that "it's more than just programming. There's a whole range of other roles like project management, business consulting and systems architecture." These people-oriented jobs are generally more appealing to women, who often have the interpersonal skills to do well in them. In the same article, Deannah Templeton, a senior consultant with Microsoft, says that schools, universities and IT companies fail to communicate and portray the industry's diversity to girls.

Strategies for Change

During 2006 and 2007, the authors intend to implement some strategies in order to tackle the misperceptions that persist in the IT industry. The intention will be to increase awareness around some of the people-oriented roles within IT that are often more appealing to women.
These strategies for change include:

- Profiling Female graduates working within the industry
- Camp Techette
- Role Model Day – partnering with industry, and
- Project funding options

Profiling Female Graduates Working within the Industry

An Alumni is under development and as part of this, the plan is to profile some of the excellent female graduates from the ICT degree at UCOL. Successful graduates have found positions in a diverse range of organizations such as New Zealand Trade and Enterprise, Land Transport Authority, Provenco, City Councils and Toyota New Zealand. Profiling the roles being carried out in this range of organizations will help to demonstrate that IT is integral in all business processes and covers a wide range of industries. Additionally, there will be close liaison with the UCOL marketing team in the preparation of promotional material. Initial discussions with marketing indicate that they are very enthusiastic and supportive of these initiatives.

Camp Techette

A similar program has been run in Chicago hosted by CISCO (a multinational corporation focused on producing networking tools and curriculum). A similar initiative will be trialled during UCOL's 'Winta Flava' program which runs in the winter semester break in July this year. This will be targeted at secondary female school students years 11-13. Taster sessions in different areas of IT will be scheduled which will involve rotated sessions on areas such as web design where they will design their own website, networking where they will set up a LAN etc. The aim will be to show participants how technology can change the way they work, live, play and learn and even shop! A main focus of the

camp will attempt to provide clear guidance on career opportunities and roles available within IT. To aid in this, involve some role models from industry will be recruited to talk about their roles and career opportunities. The week will end with participants working through a career in IT selection questionnaire to help them identify which roles within IT they may be suited to. The last day could end with a careers night for parents, teachers and career guidance counsellors. During this session, the participants from Camp Techette will be able showcase their creations from their taster sessions.

Role Model Day – Partnering with Industry

As well as full week programs such as Camp Techette, it is intended that one off sessions will be offered, profiling successful women working in Industry. These sessions could include a discussion on: how they got started in the industry and what influenced their choice; what education they may have undertaken; any barriers they have faced; what working in a male dominated industry is like; and finally any advice they may have for girls/women choosing a career in the industry.

Project Funding Options

The Thomas George McCarthy Trust, and the JBS Dudding Trust both provide funding for charitable and educational organizations. Options for external funding from these trusts will be explored for initiatives such as Camp Techette to be offered on an on-going basis.

Conclusion

This paper has examined the reasons behind low female participation in both IT tertiary education and the IT industry, and has identified female role modeling as an excellent way to encourage females into the field of IT. Such role modeling may help to dispel many of the misperceptions about the industry. Female representation and role modeling is intensifying but more work is still required in this area to increase awareness of the types of work roles and career opportunities being carried out by both males and females in the IT industry. Planned strategies and promotional initiatives have been discussed to enable the industry to be profiled by women, to women, in an attempt to reverse the gender imbalance that is occurring in tertiary level IT education in New Zealand.

References

Ayling, D. (2004). The warp and the weft: Weaving work and learning with workplace mentors? In C. Eames (Ed.), Proceedings of the 5th Asia Pacific Cooperative Education Conference (pp. 1-7). Auckland: NZACE.

Davidson, P., & Griffin, R.W. (2003). Management: An Australasian perspective (2nd ed.). Australia: John Wiley & Sons.

Grainger, J. (1992). The path to the organization: Some factors which influence women's career choices. In S. Olsson (Ed.), The gender factor (pp. 46-55). Palmerston North, New Zealand: Dunmore.

Greenwood, D. (2002). Renovating the glass ceiling. Retrieved March 3, 2003, from http://www.unlimited.co.nz/webhome.nsf/printdoc

O'Keefe, B. (2004, May 12). Girls take up computer challenge. The Australian, p.8.

Martin, F. (2002). What's gender got to do with it? Retrieved March 3, 2003, from http://www.unlimited.co.nz

Melymuka, K. (2001). Survey highlights gender gap on IT issues. Retrieved March 6, 2003, from http://www.unlimited.co.nz/webhome.nsf/printdoc

Rudman, R. (2002). Human resource management in new Zealand (4th ed.). Auckland, New Zealand: Pearson Education.

Thorp, D. (2004, March 23). Geeks need a makeover to attract girls. The Australian, p.35.

Treston, H (1999). Mentoring: Making a positive difference for individuals and institutions. Retrieved June 12, 2006, from http://www.jcu.edu.au/studying/services/studyskills/research/ment_pvediff.rtf

Women in Technology. (2003). Retrieved on July 1, 2003, from http://www.womenintechnology.co.nz

Young, B.J. (2000). Gender differences in student attitudes toward computers. Journal of Research on Computing in Education, 33(2), 204-213.